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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,217	11/03/2003	Willem Roux	LSTC-002	3091

37804 7590 05/15/2007  
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EXAMINER
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PIERRE LOUIS, ANDRE

ART UNIT	PAPER NUMBER
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2123

MAIL DATE	DELIVERY MODE
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05/15/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/700,217	Applicant(s) ROUX, WILLEM	
	Examiner Andre Pierre-Louis	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-7 and 9-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7, 9-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/26/2007 has been entered.
2. Claims 1,8,14 are cancelled and now claims 1,3-7,9-13 are presented for examination.
3. Regarding the rejection under 35 USC 101, the Examiner withdraws the rejection in view of the amendment.

**Response to Arguments**

4. Applicant's arguments filed 04/26/2007 have been fully considered but they are somewhat persuasive.

4.1 Applicant argues that Venkataraman does not teaches “identifying high likelihood bifurcation region of a FEA model that represents the structural product”, the examiner note that Venkataraman teaches a Response Surface Methodology in which data points are selected or identified for the evaluation of response function in the design (*see pg.136*) and that design points are chosen to maximize the predictive capability of the approximating function and minimize variance error and constructed the response surface approximations for prediction of the response of other design points of interest (*see 136-139, 170-173*); *also see fig.6.7-6.8 for a plot of Response surface prediction load and local bifurcation region of the finite element response*). However, a secondary reference is brought in to further support the Examiner’s position in the rejection of the instant claims renders moot the Applicant arguments.

4.2 While the applicant believes that the independent claims, along with the dependent claims should be found allowable, the examiner respectfully disagrees and asserts that the combined references cited teach the entire claimed invention. Applicant is further encouraged to look at the new references not used shown in the conclusion section below. However, the grounds of rejections below fully support the Examiner's position in rejecting the instant claims.

**Claim Rejections - 35 USC § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the

5.0 Claims 1,3-7,9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Venkataraman (*Modeling, Analyzing, and Optimization of Cylindrical Stiffened Panels for Reusable Launch Vehicle Structures, 1999*), in view of Tyron, III et al. (U.S. Patent No. 7,006,947).

5.1 In considering the independent claims 1,7, and 13, Venkataraman substantially teaches a method for distinguishing effect due to design variable changes used in a finite element analysis for designing a structural product, in particular the steps of: obtaining in a computing device a plurality of finite element analysis responses for a set of design experiments, wherein each of the set of design experiments has a specific combination of design variables values (pg.62-67, 163-167); constructing a metamodel from the plurality of finite element responses (pg.4-5,29-33,128-139,154,170); and selecting a set of outliers from the set of design experiments whose finite element analysis responses are not predicted by the metamodel (pg.47-

48,135-138); identifying high likelihood bifurcation region of a FEA that represents the structural product by plotting an indicating quantity of the finite element responses (*pg.128-130, 170-174*); and examining the finite element responses of a couple of outliers to determine whether the effects are due to bifurcation or due to the design variable changes, wherein the couple of the outliers is maximum and minimum of the set of outliers (*pg.170-173, 137*).

Although Venkataraman does specifically teach the term high likelihood bifurcation region of a FEA, he teaches a Response Surface Methodology in which data points are selected or identified for the evaluation of response function in the design (*see pg.136*) and that design points are chosen to maximize the predictive capability of the approximating function and minimize variance error and constructed the response surface approximations for prediction of the response of other design points of interest (*see 136-139, 170-173*); *also see fig.6.7-6.8 for a plot of Response surface prediction load and local bifurcation region of the finite element response*).

Nevertheless, Tyron, III et al. substantially teaches identifying failure mechanism, such as buckling/bifurcation in a FEA and examine the FEA to determine which of the identified failure mechanism are active (*fig.2a-d, col.5 lines 36-col.6 lines 45; also see fig.5*). Venkataraman and Tyron, III et al. are analogous art because they are from the same field of endeavor and that the method and apparatus teaches by Tyron, III et al. is similar to that of Venkataraman. Therefore, it would have been obvious to one ordinary skilled in the art at the time of the applicant's invention to combine the prediction failure system of Tyron, III et al. with the FEA system of Venkataraman because Tyron, III et al. teaches advantage of using the probabilistic analysis to provide a more accurate prediction of failure and a more rational design decisions at reduced cost and time (*col.4 lines 26-37*).

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5.2 With regards to claims 3 and 9, the combined teaching of Venkataraman and Tyron, III et al. substantially teach that the metamodel is constructed using least squares fitting techniques (*see Venkataraman pg.4-5, 154-157*).

5.3 As per claims 4 and 10, the combined teaching of Venkataraman and Tyron, III et al. substantially teach that the metamodel is based on nodal displacement (*see Venkataraman pg.10-13, 21,36-45,125,179*).

5.4 With regards to claims 5 and 11, the combined teaching of Venkataraman and Tyron, III et al. substantially teach that the metamodel is based on acceleration history (*see Venkataraman pg.10-13, 21,36-45,125,179*).

5.5 Regarding claims 6 and 12, the combined teaching of Venkataraman and Tyron, III et al. substantially teach that the indicating quantity is chosen from the group consisting of standard deviation and range (*see Venkataraman pg.140-141*).

### **Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

6.1 Rassaian (U.S. Patent No. 6,813,749) teaches a method, system and computer program product for multidisciplinary design analysis of structural design.

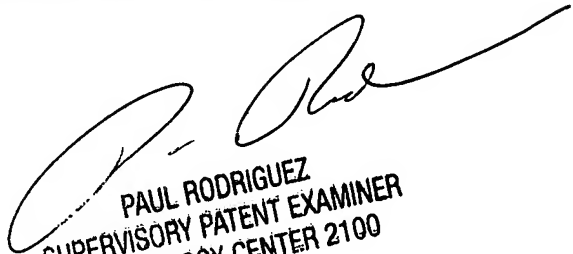
7. Claims 1, 3-7,9-13 are rejected and **THIS ACTION IS Non-FINAL**. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre Pierre-Louis whose telephone number is 571-272-8636. The examiner can normally be reached on Mon-Fri, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

May 10, 2007

APL



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